

CLAIMS

1. Power train (1) of a motor vehicle with at least two drivable motor vehicle axles (4, 5), with a main transmission (3) arranged between a motor (2) and the motor vehicle axles (4,5) for representing various gear ratios, and with one controllable and regulatable friction-locking clutch (k_VA, k_HA) arranged between the main transmission (3) and each of the motor vehicle axes (4, 5), respectively, whose transmission capacity is adjustable by means of an actuator system (10), wherein a drive torque is distributable between the drivable motor vehicle axles (4, 5) as a function of the set transmission capacities of the clutches (k_VA, k_HA).

2. Power train of a motor vehicle 1, wherein the transmission capacity of the clutches (k_VA, k_HA) can be controlled and regulated by a common actuator (12).

3. Power train according to claim 1, wherein the transmission capacities of the clutches (k_VA, k_HA) can be controlled and regulated by separate actuators (12A, 12B).

4. Power train according to claim 2 or 3, wherein the actuator (12; 12A, 12B) is constructed as an electric motor whose rotational drive motion can be converted by means of a converter apparatus (13) into translational activation for the clutches (k_VA, k_HA).

5. Power train according to claim 4, wherein the converter apparatus (13) has two ball-type linear drives (14, 15; 33, 34) that are operatively connected to one another.

6. Power train according to claim 4, wherein the ball-type linear drives (14, 15) comprise a common nut (26), which is fixed in place in an axial direction and can be rotationally driven by the electric motor (12), and a spindle (14B, 15B), respectively, wherein a rotation of the nut (16) results in corresponding translational movements of the spindles (14B, 15B), such that the transmission capacity of one of the clutches (k_VA or k_HA) varies and the

transmission capacity of the respectively other clutch (k_{VA} or k_{HA}) is held at a value that corresponds to a synchronous state for this clutch (k_{VA} or k_{HA}).

7. Power train according to claim 5, wherein the ball-type linear drives (14, 15) comprise a common spindle (22), which is fixed in place in an axial direction and is non-rotatable, on which two nuts (16A, 16B) are arranged, which can be rotationally driven by the electric motor (12) and which during a rotation, as a function of the thread pitch of the ball-type linear drives (14, 15), execute translational movement corresponding with one another for activation of the clutches (k_{VA} , k_{HA}), such that the transmission capacity of one clutch (k_{VA} or k_{HA}) varies and the transmission capacity of the other clutch (k_{HA} or k_{VA}) is held at a value which corresponds to a synchronous state for this clutch (k_{HA} or k_{VA}).

8. Power train according to claim 4, wherein the converter apparatus (13) has only one ball-type linear drive (25), wherein at least one spring system (26) is arranged between the clutches (k_{VA} , k_{HA}) and the ball-type linear drive (25), by means of which, during a translational activation motivation of the ball-type linear drive (25), at the same time activations of the clutches (k_{VA} , k_{HA}) respectively opposite one another can be generated such that the transmission capacity of one of the clutches (k_{VA} or k_{HA}) varies and the transmission capacity of the respectively other clutch (k_{HA} or k_{VA}) is held at a value which corresponds to a synchronous state for this clutch (k_{VA} , k_{HA}).

9. Power train according to one of claims 1 to 3, wherein the actuator system (10) is constructed with one actuator (12A, 12B) and a corresponding ball-type linear drive (33, 34) for each of the clutches (k_{VA} , k_{HA}), wherein the actuation of the actuators (12A, 12B) is coupled to one another, and in each case an activation of the one clutch (k_{VA}) is adapted to the activation of the other clutch (k_{HA}) such that the transmission capacity of one clutch (k_{VA} or k_{HA}) varies and the transmission capacity of the other clutch (k_{HA} or k_{VA}) is held at a value which corresponds to a synchronous state for this clutch (k_{HA} or k_{VA}).

10. Method for controlling and regulating a power train (1) in accordance with one of the preceding patent claims, wherein, for distribution of a drive torque

between the two drivable motor vehicle axles (4, 5), the transmission capacity of the two clutches (k_{VA} , k_{HA}) is adjusted such that one clutch (k_{VA} or k_{HA}) has a synchronous state and the transmission capacity of the other clutch (k_{HA} or k_{VA}) varies between a lower threshold ($W(u)$) and an upper threshold ($W(o)$), which corresponds to a synchronous state for the clutches (k_{VA} , k_{HA}).

11. Method according to claim 10, wherein in the presence of the lower threshold ($W(u)$) of the transmission capacity of the clutches (k_{VA} , k_{HA}), essentially no torque is transmitted from the clutches (k_{VA} , k_{HA}), and in the synchronous state of the clutches (k_{VA} , k_{HA}) a drive torque bearing on one clutch (k_{VA} , k_{HA}) is transmitted entirely, and at least nearly loss-free.

12. Method according to claim 10 or 11, wherein in the presence of a transmission capacity of one clutch (k_{VA} or k_{HA}) that corresponds to the lower threshold ($W(u)$), essentially no drive torque is directed to the motor vehicle axle (4 or 5) that is connected downstream from this clutch (k_{VA} or k_{HA}), and wherein the drive torque of the motor is directed essentially entirely to the motor vehicle axle (5 or 4) that is connected downstream from the synchronous clutch (k_{VA} or k_{HA}).

13. Method according to one of claims 10 to 12, wherein a degree of distribution of drive torque varies between the two motor vehicle axles (4, 5) as a function of the transmission capacity of the clutch (k_{VA} , k_{HA}) whose transmission capacity is being altered.